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Great Falls Lake, White and Van Buren Counties, Tennessee

National Eutrophication Survey, Las Vegas, Nev

Prepared for

Environmental Monitoring and Support Lab, Las Vegas

Sep 76

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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NATIONAL EUTROPHICATION SURVEY

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REPORT
ON
GREAT FALLS LAKE
WHITE AND VAN BUREN COUNTIES
TENNESSEE

EPA REGION IV

WORKING PAPER No. 449

WITH THE COOPERATION OF THE

TENNESSEE DEPARTMENT OF PUBLIC HEALTH

AND THE

TENNESSEE NATIONAL GUARD

SEPTEMBER 1976

1a

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point source discharge reduction and nonpoint source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's freshwater lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by the U.S. Environmental Protection Agency and to augment plans implementation by the states.

ACKNOWLEDGMENTS

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Tennessee Department of Public Health for professional involvement, to the Tennessee National Guard for conducting the tributary sampling phase of the Survey, and to those Tennessee wastewater treatment plant operators who provided effluent samples and flow data.

The staff of the Division of Water Quality Control, Tennessee Department of Public Health; the Division of Environmental Planning, Tennessee Valley Authority; and the Nashville District Corps of Engineers provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper series.

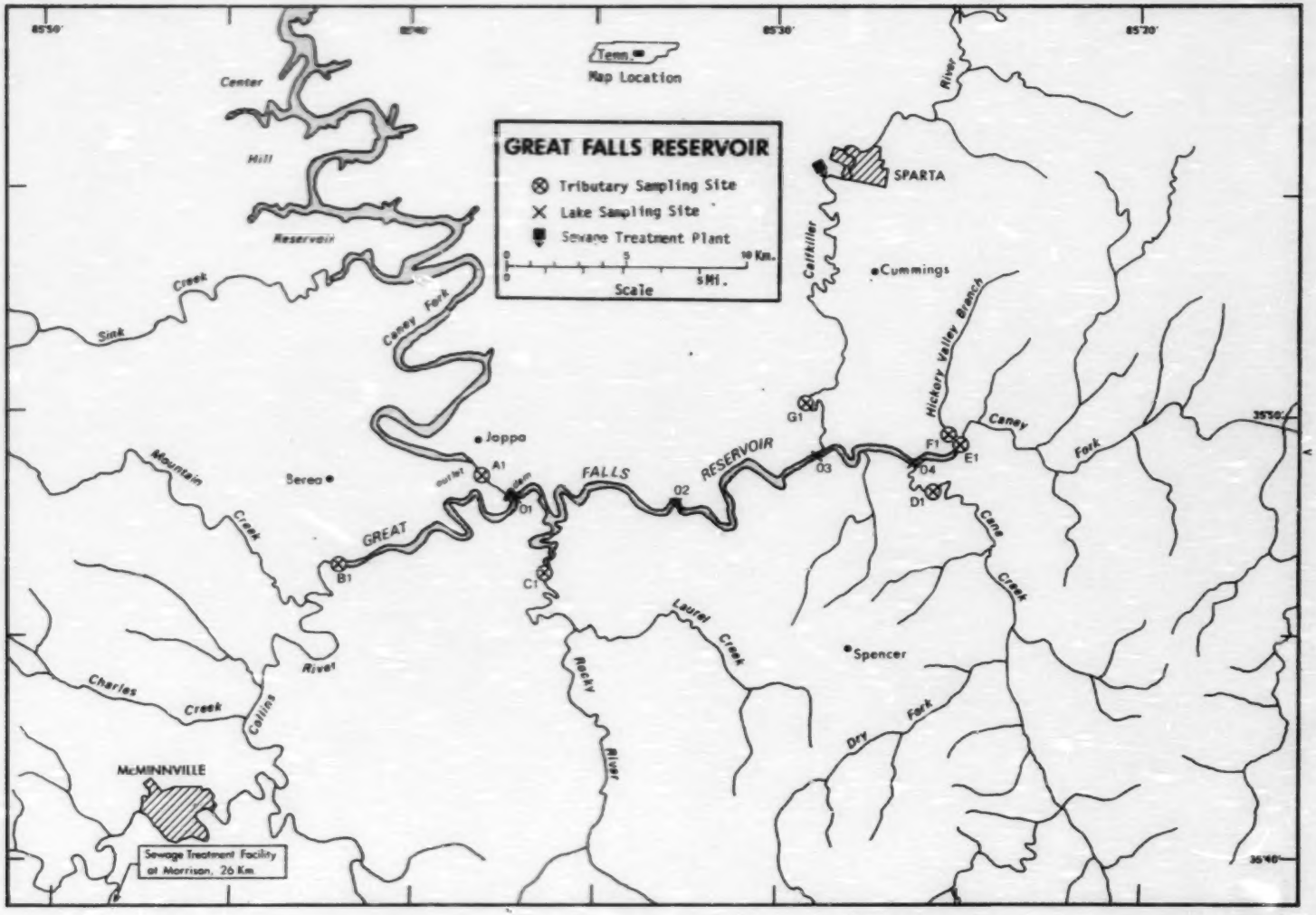
Major General William C. Smith, former Adjutant General of Tennessee, and Project Officer Colonel Wilburn C. Johnson, who directed the volunteer efforts of the Tennessee National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF TENNESSEE

LAKE NAME	COUNTY
Barkley	Stewart, Montgomery (Trigg, Lyon in KY)
Boone	Washington, Sullivan, Carter
Cheatham	Cheatham, Davidson
Cherokee	Jefferson, Hamblen, Grainger, Hawkins
Chickamauga	Hamilton, Rhea, Meigs, McMinn
Douglas	Sevier, Jefferson, Cocke
Fort Loudon	Loudon, Knox, Blount
Great Falls	White, Van Buren
Nickajack	Marion, Hamilton
Old Hickory	Sumner, Davidson, Wilson, Smith, Trousdale
Percy Priest	Davidson, Rutherford
Reelfoot	Obion
South Holston	Sullivan (Washington in VA)
Tims Ford	Moore, Franklin
Watts Bar	Rhea, Meigs, Cumberland, Roane, Loudon
Woods (Elk River)	Franklin, Coffee


GREAT FALLS RESERVOIR
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Plant
Scale
Map Location
Tenn.
SPARTA
Cummings
McMINNVILLE
Joppa
Berea
Spencer
Center Hill Reservoir
Caney Fork
Sink Creek
Mountain Creek
Charles Creek
Collins River
Rocky River
Laurel Creek
Dry Fork
Cane Creek
Hickory Valley Branch
Caithiller River
GREAT FALLS RESERVOIR
Sewage Treatment Facility at Morrison, 26 Km.
A1
B1
C1
D1
E1
F1
G1
01
02
03
04
85°50'
85°40'
85°30'
85°20'
35°50'
35°40'

REPORT ON GREAT FALLS LAKE, TENNESSEE

STORET NO. 4713

I. CONCLUSIONS

A. Trophic Condition:*

Based on field observations and Survey data, Great Falls Reservoir is considered mesotrophic. The lake water was generally turbid and brown as a result of clay siltation. Median Secchi disc readings were 50 cm in the spring, and 180 cm in the summer and fall. Chlorophyll a values ranged from <0.5 µg/l in the spring to 8.8 µg/l in the summer, with a mean of 4.0 µg/l. Of the 16 Tennessee lakes sampled in 1973, 13 had higher total phosphorus, 11 had higher inorganic nitrogen, and 14 had higher orthophosphorus levels than Great Falls Lake.

Survey limnologists reported some emergent and submerged vegetation in the lake shallows during the fall sampling, but no visible algal blooms.

B. Rate-Limiting Nutrient:

Algal assay results indicate that Great Falls Reservoir was limited by available phosphorus. Spikes with phosphorus or phosphorus and nitrogen simultaneously resulted in increased assay yields. The addition of nitrogen alone did not stimulate a growth

*See Appendix E.

response. The lake ratios (N/P) of total available inorganic nitrogen to orthophosphorus (32/1 or greater on all sampling occasions) substantiate these results.

C. Nutrient Controllability:

1. Point sources -

During the sampling year, known point sources accounted for 14.3% of the total phosphorus load reaching Great Falls Lake. The city of McMinnville was estimated to have contributed 9.3%, and the city of Sparta to have contributed 3.6%. Septic tank seepage from the Levi Strauss & Co. plant into the Rocky River is known to exist (S. Fishel, pers. comm.); however, nutrient contributions from that unmeasured seepage are not quantified at this time.

The calculated phosphorus loading of 15.37 g $P/m^2/yr$ is approximately five times that proposed by Vollenweider (1975) as "eutrophic" for a lake of such volume and retention times. The combination of a mesotrophic condition and high phosphorus loading is possible because Vollenweider's model probably is not applicable to lakes with short hydraulic retention time (8 days for Great Falls Lake), or in which epilimnetic light penetration is severely reduced by the presence of suspended sediments in the surface waters. In any case, it does not appear likely that point-source phosphorus control would result in any appreciable improvement in the trophic condition of the lake.

2. Nonpoint sources -

The total phosphorus load from nonpoint sources accounted for 85.7% of the loading reaching the impoundment. The Collins River contributed 62.2%, and the Calfkiller River contributed 12.3% of the total. Ungaged tributaries were estimated to have contributed 1.4%.

The Collins River and Calfkiller River had phosphorus export rates of 45 kg/km^2/yr and 33 kg/km^2/yr, respectively. These rates are much higher than the rates of other unimpacted tributaries to Great Falls Reservoir (see Section IV-D). Such inflation of background nutrient loading may be due to underestimation of the known municipal point source contributions to the two rivers, or to unknown point sources existing upstream. Further study is recommended to determine the cause of these high export rates.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

Lake and drainage basin characteristics are itemized below. Lake morphometry data and hydraulic retention time were provided by the Tennessee Valley Authority. Tributary flow data were provided by the Tennessee District Office of the U.S. Geological Survey (USGS). Outlet drainage area includes the lake surface area. Drainage area for tributary B(1), the Collins River, was provided by the Tennessee Valley Authority. Tributary drainage areas plus the lake surface area do not equal the outlet drainage area, probably because of differences in the pool elevation used by the different sources in their calculations. Precipitation values are estimated by methods as outlined in National Eutrophication Survey (NES) Working Paper No. 175. A table of metric/English conversions is included as Appendix A.

A. Lake Morphometry:

1. Surface area: 12.38 km^2.
2. Mean depth: 5.0 meters.
3. Maximum depth: 21.9 meters.
4. Volume: 63.278 x 10^6 m^3.
5. Mean hydraulic retention time: 8 days.

B. Tributary and Outlet:
(See Appendix B for flow data)

1. Tributaries -

Name	Drainage area (km^2)	Mean flow (m^3/sec)
B(1) Collins River	2,046.1	38.04
C(1) Rocky River	305.6	6.69
D(1) Cane Creek	424.8	7.60
E(1) Caney Fork	852.1	17.37
F(1) Hickory Valley Branch	31.6	0.69
G(1) Calfkiller River	523.2	12.06
Minor tributaries and immediate drainage -	160.5	5.32
Totals	4,343.9	87.77
2. Outlet - A(1) Caney Fork	4,346.0	84.45

C. Precipitation:

1. Year of sampling: 185.2 cm.
2. Mean annual: 130.8 cm.

III. LAKE WATER QUALITY SUMMARY

Great Falls Lake was sampled three times during the open-water season of 1973 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from four stations on the lake and one or more depths at each station (see map, page v). During each visit, depth-integrated samples were collected from each station for chlorophyll a analysis and phytoplankton identification and enumeration. During the first visit, 18.9-liter depth-integrated samples were composited for algal assays. Maximum depths sampled were 19.8 meters at Station 1, 16.8 meters at Station 2, 11.9 meters at Station 3, and 7.9 meters at Station 4. For a more detailed explanation of National Eutrophication Survey methods, see NES Working Paper No. 175.

The results obtained are presented in full in Appendix C and are summarized in III-A for waters at the surface and at the maximum depth for each site. Results of the phytoplankton counts and chlorophyll a determinations are included in III-B. Results of the limiting nutrient study are presented in III-C.

GREAT FALLS LAKE
STORET CODE 4713

PHYSICAL AND CHEMICAL CHARACTERISTICS

PARAMETER	(5/31/73) S*** = 4 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(8/17/73) S*** = 4 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(10/24/73) S*** = 4 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)												
0.-1.5 M DEPTH	7	8.0- 35.0	17.0	0.0- 1.5	8	26.1- 72.0	47.4	0.0- 1.5	7	17.5- 82.0	72.0	0.0- 1.5
MAX DEPTH**	4	16.2- 35.0	16.4	0.0- 19.8	4	16.5- 19.5	18.3	7.9- 16.8	4	15.3- 17.7	16.3	4.3- 14.0
DISSOLVED OXYGEN (MG/L)												
0.-1.5 M DEPTH	4	8.2- 9.4	8.9	0.0- 1.5	5	6.8- 8.8	7.4	0.0- 1.5	3	5.6- 9.4	8.8	1.5- 1.5
MAX DEPTH**	4	8.6- 9.4	8.9	0.0- 19.8	4	0.2- 2.2	0.8	7.9- 16.8	4	0.2- 8.6	4.3	4.3- 14.0
CONDUCTIVITY (UMHOS)												
0.-1.5 M DEPTH	7	80.- 115.	105.	0.0- 1.5	8	151.- 183.	162.	0.0- 1.5	6	188.- 234.	216.	0.0- 1.5
MAX DEPTH**	4	80.- 165.	125.	0.0- 19.8	4	163.- 212.	198.	7.9- 16.8	4	174.- 244.	230.	4.3- 14.0
PH (STANDARD UNITS)												
0.-1.5 M DEPTH	7	6.7- 7.3	7.2	0.0- 1.5	6	7.4- 8.0	7.7	0.0- 1.5	7	7.5- 8.1	7.9	0.0- 1.5
MAX DEPTH**	4	6.7- 7.3	7.1	0.0- 19.8	4	7.0- 7.4	7.3	7.9- 16.8	4	7.2- 7.9	7.5	4.3- 14.0
TOTAL ALKALINITY (MG/L)												
0.-1.5 M DEPTH	7	22.- 44.	35.	0.0- 1.5	6	62.- 72.	65.	0.0- 1.5	7	93.- 118.	102.	0.0- 1.5
MAX DEPTH**	4	22.- 72.	42.	0.0- 19.8	4	75.- 122.	107.	7.9- 16.8	4	87.- 132.	129.	4.3- 14.0
TOTAL P (MG/L)												
0.-1.5 M DEPTH	7	0.016-0.044	0.030	0.0- 1.5	6	0.015-0.020	0.018	0.0- 1.5	7	0.013-0.029	0.023	0.0- 1.5
MAX DEPTH**	4	0.016-0.042	0.035	3.0- 19.8	4	0.014-0.019	0.015	7.9- 16.8	4	0.013-0.061	0.049	4.3- 14.0
DISSOLVED ORTHO P (MG/L)												
0.-1.5 M DEPTH	7	0.004-0.012	0.009	0.0- 1.5	6	0.005-0.008	0.006	0.0- 1.5	7	0.004-0.010	0.007	0.0- 1.5
MAX DEPTH**	4	0.004-0.011	0.007	0.0- 19.8	4	0.004-0.011	0.005	7.9- 16.8	4	0.006-0.024	0.007	4.3- 14.0
NO2+NO3 (MG/L)												
0.-1.5 M DEPTH	7	0.220-0.460	0.360	0.0- 1.5	6	0.070-0.230	0.120	0.0- 1.5	7	0.100-0.140	0.110	0.0- 1.5
MAX DEPTH**	4	0.240-0.640	0.370	0.0- 19.8	4	0.130-0.610	0.270	7.9- 16.8	4	0.040-0.300	0.145	4.3- 14.0
AMMONIA (MG/L)												
0.-1.5 M DEPTH	7	0.050-0.110	0.080	0.0- 1.5	6	0.070-0.110	0.085	0.0- 1.5	7	0.060-0.110	0.070	0.0- 1.5
MAX DEPTH**	4	0.060-0.090	0.075	0.0- 19.8	4	0.140-0.670	0.315	7.9- 16.8	4	0.040-0.730	0.335	4.3- 14.0
KJELDAHL N (MG/L)												
0.-1.5 M DEPTH	7	0.200-0.780	0.500	0.0- 1.5	6	0.400-0.800	0.500	0.0- 1.5	7	0.200-0.600	0.400	0.0- 1.5
MAX DEPTH**	4	0.200-0.500	0.300	0.0- 19.8	4	0.200-1.300	0.900	7.9- 16.8	4	0.200-1.100	0.600	4.3- 14.0
SECCHI DISC (METERS)	0	*****-*****	*****		0	*****-*****	*****		0	*****-*****	*****	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

B. Biological Characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
05/31/73	1. Flagellates	112
	2. Dinoflagellates	22
	3. Stephanodiscus	22
	Total	156
08/17/73	1. Synedra	925
	2. Flagellates	661
	3. Achnanthes	375
	4. Cyclotella	308
	5. Stephanodiscus	154
	Other genera	618
	Total	3,041
10/24/73	1. Flagellates	1,653
	2. Tetraedron	1,290
	3. Dactylococcopsis	444
	4. Dinobryon	383
	5. Stephanodiscus	222
	Other genera	323
	Total	4,315

2. Chlorophyll *a* -

Sampling Date	Station Number	Chlorophyll *a* (µg/l)
05/31/73	1	0.6
	2	0.6
	3	<0.5
	4	<0.5
08/17/73	1	8.8
	2	8.8
	3	6.8
	4	3.2
10/24/73	1	5.4
	2	3.5
	3	6.1
	4	3.0

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike(mg/l)	Ortho P Conc.(mg/l)	Inorganic N Conc.(mg/l)	Maximum Yield (mg/l-dry wt.)
Control	0.008	0.312	0.1
0.05 P	0.058	0.312	6.5
0.05 P + 1.0 N	0.058	1.312	15.2
1.00 N	0.008	1.312	0.1

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, suggests that primary productivity was low in Great Falls Reservoir at the time of sampling. The lake was phosphorus limited at that time as indicated by the increased growth of the test alga in response to the addition of orthophosphorus. Spikes with nitrogen and phosphorus simultaneously resulted in maximum yield, while the addition of nitrogen alone did not stimulate growth beyond the control yield. The lake's total N/P ratios for spring, summer, and fall were respectively 53/1, 67/1, and 32/1, further indicating phosphorus limitation.

VI. NUTRIENT LOADINGS
(See Appendix D for data)

For the determination of nutrient loadings, the Tennessee National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff month of February when two samples were collected. Sampling was begun in April 1973, and was completed in March 1974 for sites A(1)-C(1). Sampling was completed in April 1974 for sites D(1)-G(1).

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Tennessee District Office of the USGS for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a USGS computer program for calculating stream loadings. Nutrient loads indicated for tributaries are those measured minus known point source loads, if any.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of USGS) were estimated by using the mean annual nutrient loads, in $kg/km^2/yr$, for Cane Creek and Caney Fork at Stations D(1) and E(1), and by multiplying the means by the ZZ area in km^2.

Nutrient loads for the cities of Sparta, McMinnville, and Morrison wastewater treatment plants were estimated at 1.134 kg P and 3.401 kg N/capita/yr.

A. Waste Sources:

1. Known municipal -

Name	Population Served†	Treatment†	Mean Flow ($m^3/d \times 10^3$)	Receiving Water†
Sparta	4,500*	Trickling filter*	1.703**	Calfkiller River*
McMinnville	11,610	Activated sludge	5.450†	Barren Fork River/Collins River
Morrison (West Warren Utility District)	1,800	Trickling filter	0.250†	Keel Branch Hickory Creek/ Collins River

2. Known industrial - None

†S. Fishel, personal communication.
*Treatment plant questionnaire.
**Estimated at 0.3785 m^3/capita/day.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/yr	% of total
a. Tributaries (nonpoint load) -		
B(1) Collins River	87,800	62.4
C(1) Rocky River	3,375	2.4
D(1) Cane Creek	3,190	2.3
E(1) Caney Fork	6,420	4.6
F(1) Hickory Valley Branch	555	0.4
G(1) Calfkiller River	17,415	12.4
b. Minor tributaries and immediate drainage (nonpoint load) -	1,285	0.9
c. Known municipal STP's -		
Sparta	5,105	3.6
McMinnville	13,165	9.4
Morrison	2,040	1.4
d. Septic tanks* -	20	<0.1
e. Known industrial - None		
f. Direct precipitation** -	215	0.2
Total	140,585	100.0

2. Output - A(1) Caney Fork 72,460

3. Net annual P accumulation - 68,125

*Estimate based on 2 camps and 60 dwellings.
**Estimated (see NES Working Paper No. 175).

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/yr	% of total
a. Tributaries (nonpoint load) -		
B(1) Collins River	1,352,485	54.7
C(1) Rocky River	174,755	7.1
D(1) Cane Creek	125,220	5.1
E(1) Caney Brook	263,140	10.6
F(1) Hickory Valley Brook	19,225	0.8
G(1) Calfkiller River	416,020	16.8
b. Minor tributaries and immediate drainage (nonpoint load) -	48,470	2.0
c. Known municipal STP's -		
Sparta	15,305	0.6
McMinnville	39,485	1.6
Morrison	6,120	0.2
d. Septic tanks* -	780	<0.1
e. Known industrial - None		
f. Direct precipitation** -	13,365	0.5
Totals	2,474,370	100.0
2. Output - A(1) Caney Fork	1,862,355	
3. Net annual N accumulation -	612,015	

*Estimate based on 2 camps and 60 dwellings.
**Estimated (see NES Working Paper No. 175).

D. Mean Annual Nonpoint Nutrient Export by Subdrainage Area:

Tributary	kg P/km^2/yr	kg N/km^2/yr
B(1) Collins River	43	661
C(1) Rocky River	11	572
D(1) Cane Creek	8	295
E(1) Caney Fork	8	309
F(1) Hickory Valley Brook	18	608
G(1) Calfkiller River	33	795

E. Yearly Loading:

In the following table, the existing phosphorus annual loading is compared to the relationship proposed by Vollenweider (1975). Essentially, his "eutrophic" loading is that at which the receiving waters would become eutrophic or remain eutrophic; his "oligotrophic" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A "mesotrophic" loading would be considered one between eutrophic and oligotrophic.

Note that Vollenweider's model may not apply to lakes with short hydraulic retention times or in which light penetration is severely restricted by high concentrations of suspended solids in the surface waters.

	Total Yearly Phosphorus Loading ($g/m^2/yr$)
Estimated loading for Great Falls Lake	11.36
Vollenweider's "eutrophic" loading	3.00
Vollenweider's "oligotrophic" loading	1.50

V. LITERATURE REVIEWED

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VI. APPENDICES

APPENDIX A

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX B

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4713 GREAT FALLS RESERVOIR

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 4346.0

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
4713A1	4346.0	132.24	159.71	203.88	155.74	92.31	38.23	32.00	24.21	17.61	22.51	35.96	103.36	84.45
4713B1	1955.4	66.83	86.08	86.08	58.90	32.28	20.53	14.75	10.90	8.55	7.28	22.23	45.31	38.04
4713C1	305.6	12.97	16.28	15.09	10.48	5.69	2.24	2.27	1.70	1.30	1.10	3.06	8.69	6.69
4713D1	424.8	18.010	22.569	20.983	14.555	0.343	0.190	0.125	0.074	1.671	1.393	0.212	12.063	7.598
4713E1	852.1	24.49	35.96	45.87	39.36	28.60	15.09	4.39	2.70	4.11	1.77	1.86	5.69	17.37
4713F1	31.6	1.34	1.68	1.56	1.08	0.59	0.24	0.20	0.16	0.12	0.10	0.32	0.90	0.69
4713G1	523.2	22.31	27.47	27.50	18.35	10.08	4.98	5.10	3.03	3.03	2.23	7.02	14.64	12.06
4713ZZ	251.2	9.66	12.15	12.15	8.18	4.50	2.53	2.17	1.43	1.26	0.74	3.14	6.43	5.32

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 4346.0
SUM OF SUB-DRAINAGE AREAS = 4343.9
TOTAL FLOW IN = 1961.06
TOTAL FLOW OUT = 1017.76

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4713A1	4	73	144.982	15	87.414				
	5	73	275.806	10	97.976				
	6	73	103.640	6	186.325				
	7	73	43.891	12	49.271				
	8	73	30.157	11	29.733				
	9	73	8.750	11	1.472				
	10	73	10.930	9	7.730				
	11	73	134.222	14	17.471				
	12	73	181.511	17	57.342				
	1	74	651.287	15	1328.060				
	2	74	225.685	10	111.002	28	436.079		
	3	74	159.141	16	88.632	30	139.602		
	4	74	114.117						
4713B1	4	73	71.075	15	43.325				
	5	73	120.913	10	42.192				
	6	73	48.139	6	96.844				
	7	73	29.733	12	37.095	21	31.715		
	8	73	10.902						
	9	73	6.626	11	7.900				
	10	73	6.626	9	6.853				
	11	73	71.075	14	10.251				
	12	73	96.844	17	23.956				
	1	74	218.323	15	122.895				
	2	74	110.436	10	65.978	28	48.422		
	3	74	68.819	16	26.505	30	61.448		
	4	74	49.554						

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4713 GREAT FALLS RESERVOIR

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4713C1	4	73	11.129	15	6.796				
	5	73	18.916	10	6.570				
	6	73	7.532	6	15.121				
	7	73	4.644	12	5.777				
	8	73	1.699	11	2.095				
	9	73	1.036	11	1.237				
	10	73	1.036	9	1.070				
	11	73	11.129	14	1.603				
	12	73	15.150	17	3.738				
	1	74	33.980	15	19.199				
	2	74	17.245	10	18.336	28	7.589		
	3	74	10.768	16	4.134	30	9.599		
	4	74	7.759						
4713D1	4	73	15.461	15	9.430				
	5	73	26.278	15	4.587				
	6	73	10.449	7	38.299				
	7	73	6.456	7	2.554				
	8	73	2.367	14	3.681				
	9	73	1.438	19	1.487				
	10	73	1.438	17	1.671				
	11	73	15.461	16	1.903				
	12	73	21.039	19	4.276				
	1	74	47.289	22	16.679				
	2	74	23.956	15	19.454	28	10.534		
	3	74	14.951	16	5.748				
	4	74	10.768	12	11.100				
4713E1	4	73	31.149	15	18.916				
	5	73	52.669	15	9.231				
	6	73	20.954	7	60.881				
	7	73	12.941	7	5.097				
	8	73	4.757	14	7.362				
	9	73	2.888	19	2.973				
	10	73	2.888	17	3.341				
	11	73	31.149	16	3.823				
	12	73	42.192	19	8.580				
	1	74	95.145	22	33.414				
	2	74	48.139	15	39.077	28	21.153		
	3	74	30.014	16	11.553				
	4	74	21.606	12	22.257				
4713F1	4	73	1.159	15	0.792				
	5	73	1.954	15	0.343				
	6	73	0.776	7	2.251				
	7	73	0.481	7	0.190				
	8	73	0.176	14	0.272				
	9	73	0.108	19	0.110				
	10	73	0.108	17	0.125				
	11	73	1.159	16	0.142				
	12	73	1.566	19	0.317				
	1	74	3.511	22	1.240				
	2	74	1.784	15	1.447	28	0.784		
	3	74	1.113	16	0.428				
	4	74	0.831	12	0.827				

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4713 GREAT FALLS RESERVOIR

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4713G1	4	73	19.057	15	11.610				
	5	73	32.281	15	5.663				
	6	73	12.856	7	37.378				
	7	73	7.929	7	3.143				
	8	73	2.917	14	4.531				
	9	73	1.773	19	1.829				
	10	73	1.773	17	2.059				
	11	73	19.057	16	2.345				
	12	73	25.910	19	5.267				
	1	74	58.333	22	20.530				
	2	74	29.450	15	23.956	28	12.969		
	3	74	18.406	16	7.079				
	4	74	13.281	12	13.677				
4713ZZ	4	73	9.146						
	5	73	15.546						
	6	73	6.173						
	7	73	3.823						
	8	73	1.399						
	9	73	0.852						
	10	73	0.852						
	11	73	9.146						
	12	73	12.431						
	1	74	28.005						
	2	74	14.158						
	3	74	8.835						
	4	74	6.371						

APPENDIX C

PHYSICAL AND CHEMICAL DATA

STORET RETRIEVAL DATE 76/09/10

471301
35 48 06.0 085 37 16.0 3
GREAT FALLS LAKE
47177 TENNESSEE

052091

11EPALES 2111202
0068 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/31	12 50	0000	17.1		8	110	6.90	37	0.110	0.700	0.390	0.009
	12 50	0005	17.0	8.2		115	6.90	44	0.090	0.480	0.460	0.010
	12 50	0015	16.9	8.4		115	7.00	44	0.100	0.500	0.440	0.014
	12 50	0040	16.6	8.6		110	7.20	37	0.080	0.500	0.380	0.012
	12 50	0065	16.2	8.6		135	7.10	42	0.090	0.400	0.370	0.011
73/08/17	11 00	0000	26.9	8.8	72	163	7.90	68	0.110	0.400	0.200	0.008
	11 00	0005	26.5	7.4		162	8.05	65	0.090	0.500	0.230	0.007
	11 00	0015	22.6	4.8		115	7.90	47	0.080	0.500	0.240	0.005
	11 00	0025	20.8			178						
	11 00	0030	19.8	3.6		188	7.70	86	0.060	0.500	0.540	0.005
	11 00	0040	17.6			177						
	11 00	0055	16.5	0.2		212	7.40	122	0.670	1.100	0.130	0.004
73/10/24	12 00	0000	19.2		72	234	7.60	112	0.060	0.600	0.130	0.010
	12 00	0015	19.1	6.2		230	7.50	111	0.060	0.200K	0.130	0.012
	12 00	0035	16.5	4.6		207	7.40	106	0.200	0.400	0.240	0.016
	12 00	0046	16.4	0.2		233	7.20	130	0.560	1.000	0.040	0.008

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/31	12 50	0000	0.044	0.6
	12 50	0005	0.038	
	12 50	0015	0.042	
	12 50	0040	0.039	
	12 50	0065	0.036	
73/08/17	11 00	0000	0.015	8.8
	11 00	0005	0.019	
	11 00	0015	0.014	
	11 00	0030	0.012	
	11 00	0055	0.019	
73/10/24	12 00	0000	0.023	5.4
	12 00	0015	0.023	
	12 00	0035	0.044	
	12 00	0046	0.061	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

471302
35 48 08.0 085 32 48.0 3
GREAT FALLS LAKE
47175 TENNESSEE

052091

11EPALES 2111202
0057 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/31	13	25 0000	18.7		18	115	7.20	35	0.080	0.600	0.380	0.012
	13	25 0005	16.7	8.8		105	7.20	37	0.070	0.500	0.360	0.008
	13	25 0015	16.7	8.8		105	7.20	37	0.070	0.200K	0.380	0.012
	13	25 0035	16.7	8.8		105	7.20	38	0.070	0.200K	0.370	0.006
	13	25 0055	16.6	8.8		115	7.20	41	0.060	0.200K	0.370	0.005
73/08/17	12	05 0000	27.5	6.8	68	162	7.80	64	0.080	0.800	0.070	0.006
	12	05 0005	26.1			181						
	12	05 0010	23.9	6.8		213	7.80	99	0.070	0.300	0.410	0.008
	12	05 0015	22.8			197						
	12	05 0020	21.8	5.0		178	7.60	87	0.080	0.300	0.440	0.006
	12	05 0037	18.5	1.2		188	7.40	105	0.140	0.200	0.610	0.006
73/10/24	12	25 0000	19.7		72	230	7.50	118	0.110	0.400	0.110	0.007
	12	25 0005	19.3	5.6		228	7.50	118	0.100	0.200	0.110	0.010
	12	25 0015	19.2	5.2		228	7.50	117	0.100	0.200K	0.110	0.006
	12	25 0036	17.7	0.6		226	7.30	127	0.730	1.100	0.040	0.006

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/31	13	25 0000	0.032	0.6
	13	25 0005	0.030	
	13	25 0015	0.035	
	13	25 0035	0.035	
	13	25 0055	0.035	
73/08/17	12	05 0000	0.018	8.8
	12	05 0010	0.028	
	12	05 0020	0.012	
	12	05 0037	0.014	
73/10/24	12	25 0000	0.013	3.5
	12	25 0005	0.018	
	12	25 0015	0.014	
	12	25 0036	0.046	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

471303
35 49 07.0 085 28 53.0 3
GREAT FALLS LAKE
47175 TENNESSEE

052091

11EPALES 2111202
0042 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/31	13 50	0000	16.8		24	80	7.30	22	0.070	0.300	0.240	0.005
	13 50	0005	16.7	9.0		80	7.30	23	0.050	0.200K	0.220	0.009
	13 50	0015	16.5	9.0		165	7.30	60	0.060	0.200K	0.530	0.009
	13 50	0039	16.3	9.0		165	7.30	72	0.060	0.200	0.640	0.010
73/08/17	12 45	0000	27.2		72	157	7.60	64	0.070	0.500	0.070	0.005
	12 45	0005	26.8	7.0		183	7.60	72	0.070	0.400	0.170	0.006
	12 45	0008	25.0	7.4		159	7.50	69	0.070	0.400	0.150	0.006
	12 45	0010	23.9	6.5		156	7.50	75	0.060	0.300	0.240	0.005
	12 45	0020	22.1	6.6		200	7.30	101	0.100	0.500	0.490	0.010
	12 45	0030	19.5	2.2		163	7.30	75	0.260	1.300	0.280	0.011
73/10/24	13 05	0000	18.9		82	203	7.90	102	0.080	0.400	0.100	0.005
	13 05	0005	18.4	8.8		202	7.90	101	0.070	0.200	0.100	0.008
	13 05	0020	16.2	8.0		244	7.90	132	0.110	0.200	0.300	0.024

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/31	13 50	0000	0.021	0.5K
	13 50	0005	0.020	
	13 50	0015	0.026	
	13 50	0039	0.042	
73/08/17	12 45	0000	0.018	6.8
	12 45	0005	0.020	
	12 45	0008	0.019	
	12 45	0010	0.014	
	12 45	0020	0.030	
	12 45	0030	0.015	
73/10/24	13 05	0000	0.026	6.1
	13 05	0005	0.028	
	13 05	0020	0.053	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

471304
35 48 57.0 085 26 23.0 3
GREAT FALLS LAKE
47175 TENNESSEE

052091

11EPALES 2111202
0030 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/31	16 00	0000	18.1	9.4	35	80	6.70	22	0.090	0.500	0.240	0.004
73/08/17	14 55	0000	27.0	8.4	72	154	7.40	62	0.090	0.700	0.070	0.005
	14 55	0005	26.3			151						
	14 55	0015	22.9	5.6		148	7.30	66	0.080	0.400	0.230	0.004
	14 55	0022	20.2	2.8		163	7.20	73	0.160	0.400	0.240	0.008
	14 55	0026	18.2	0.4		207	7.00	108	0.370	0.700	0.260	0.004
73/10/24	12 50	0000	17.8		72	188	8.10	96	0.060	0.400	0.140	0.004
	12 50	0005	17.5	9.4			8.00	93	0.060	0.200K	0.140	0.007
	12 50	0014	15.3	8.6		174	7.80	87	0.040	0.200K	0.250	0.007

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/31	16 00	0000	0.016	0.5K
73/08/17	14 55	0000	0.017	3.2
	14 55	0015	0.013	
	14 55	0022	0.014	
	14 55	0026	0.015	
73/10/24	12 50	0000	0.029	3.0
	12 50	0005	0.017	
	12 50	0014	0.013	

K VALUE KNOWN TO BE
LESS THAN INDICATED

APPENDIX D

TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/09/09

4713A1
35 49 31.0 085 25 05.0 4
CANEY RIVER
47 7.5 CAMPAIGN
0/GREAT FALLS RES 052091
BANK ACROSS RIVER FROM GT FALLS HYDRO PL
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	14 00		0.290	0.100K	0.005K	0.005K	0.015
73/05/10	13 40		0.440	0.170	0.019	0.008	0.020
73/06/06	10 45		0.410	0.210	0.017	0.005K	0.021
73/07/12	10 00		0.690	0.595	0.036	0.036	0.130
73/08/11	13 35		0.360	0.300	0.042	0.007	0.030
73/09/11	14 10		0.380	0.240	0.115	0.025	0.035
73/10/09	14 15		0.330	0.150	0.052	0.027	0.040
73/11/14	13 50		0.310	0.150	0.047	0.018	0.050
73/12/17	14 15		0.552	0.200	0.024	0.020	0.030
74/01/15	14 10		0.390	2.800	0.116	0.012	0.020
74/02/10	14 00		0.400	0.600	0.075	0.010	0.015
74/02/28	13 45		0.352	0.300	0.015	0.010	0.015
74/03/30	09 25		0.300	0.500	0.020	0.005K	0.015

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

471381
35 46 40.0 085 41 50.0 4
COLLINS RIVER
47 7.5 CAMPAIGN
I/GREAT FALLS RES 052091
HENNESSEE BRDG 1 MI S OF CAMBRIDGE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	14 40		0.550	0.100K	0.005K	0.009	0.015
73/05/10	14 15		0.500	0.225	0.019	0.011	0.025
73/06/06	10 00		0.730	0.310	0.027	0.019	0.050
73/07/12	10 35		0.910	0.880	0.042	0.048	0.220
73/07/21	14 05		0.036	1.540	0.011	0.032	0.175
73/09/11	14 40		0.540	0.300	0.046	0.082	0.135
73/10/09	13 45		0.500	0.150	0.031	0.092	0.120
73/11/14	14 15		0.220	0.950	0.028	0.029	0.070
73/12/17	14 40		0.720	0.100	0.012	0.028	0.040
74/01/15	14 25		0.680	0.124	0.124	0.012	0.030
74/02/10	14 40		0.352	1.800	0.710	0.005K	0.150
74/02/28	14 20		0.610	0.800	0.410	0.010	0.035
74/03/30	10 05		0.480	0.900	0.020	0.010	0.035

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4713C1
35 46 34.0 085 36 18.0 4
ROCKY RIVER
47 7.5 DOYLE
T/GREAT FALLS RES 052091
BLANKS BRDG 1.5 W OF BONES CAVE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	13 15		0.230	0.100K	0.006	0.005K	0.005K
73/05/10	14 00		0.240	0.180	0.011	0.005K	0.010
73/06/06	10 20		0.290	0.295	0.008	0.009	0.025
73/07/12	09 35		0.105	0.200	0.011	0.005K	0.020
73/08/11	13 15		0.240	0.290	0.027	0.005K	0.015
73/09/11	13 45		0.075	0.370	0.040	0.005K	0.025
73/10/09	14 40		0.067	0.200	0.017	0.007	0.015
73/11/14	13 45		0.460	0.550	0.048	0.006	0.020
73/12/17	13 45		0.520	0.100K	0.012	0.012	0.020
74/01/15	13 30		0.440	0.300	0.104	0.008	0.020
74/02/10	13 25		0.616	2.100	0.220	0.010	0.010
74/02/28	13 25		0.276	1.200	0.780	0.005K	0.020
74/03/30	08 50		0.312	0.900	0.070	0.005K	0.005

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

47130 1
35 48 20.0 085 25 30.0 4
CANE CREEK
47 7.5 BALD KNOB
T/GREAT FALLS RES 052091
SEC RD BRDG 2.3 MI E OF CUMMINGSVILLE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	10 10		0.074	0.130	0.021	0.005K	0.005K
73/05/15	14 00		0.086	0.120	0.009	0.005K	0.005K
73/06/07	14 10		0.084	0.260	0.013	0.009	0.030
73/07/07	10 45		0.231	2.000	0.060	0.005K	0.040
73/08/14	16 10		0.019	1.500	0.035	0.007	0.020
73/09/19	15 55		0.260	0.160	0.023	0.005K	0.015
73/10/17	16 00		0.168	0.100K	0.009	0.008	0.010
73/11/16	16 30		0.140	0.100K	0.015	0.006	0.015
73/12/19	16 10		0.140	0.100K	0.008	0.008	0.008
74/01/22	16 00		0.156	0.100	0.016	0.005K	0.005K
74/02/15	16 15		0.096	0.300	0.055	0.005K	0.005K
74/02/28	15 00		0.108	0.100K	0.047	0.005K	0.015
74/04/12	16 20		0.064	0.100	0.015	0.005	0.005

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4713E1
35 50 43.0 085 28 24.0 4
CANEY FORK
47 7.5 BALD KNOB
T/GREAT FALLS RES 052091
NEd YOUNGS MILL BRDG 10 MI S OF SPARTA
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	09 55		0.110		0.039	0.005K	0.005K
73/05/15	14 00		0.110	0.110	0.019	0.005K	0.005K
73/06/07	13 30		0.150	0.400	0.028	0.010	0.035
73/07/07	10 30		0.210	0.230	0.018	0.005K	0.015
73/08/14	15 55		0.010K	0.230	0.012	0.005K	0.015
73/09/19	15 35		0.300	0.850	0.027	0.005K	0.015
73/10/17	15 40		0.210	1.130	0.056	0.007	0.012
73/11/16	16 10		0.100	0.150	0.014	0.005K	0.010
73/12/19	16 00		0.184	0.100K	0.005K	0.008	0.008
74/01/22	16 20		0.216	0.300	0.264	0.005K	0.010
74/02/15	16 00		0.176	0.100K	0.025	0.005K	0.005K
74/02/28	14 40		0.152	0.100K	0.030	0.005K	0.015
74/04/12	16 10		0.088	0.100K	0.020	0.005K	0.005K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4713F1
35 49 35.0 085 25 15.0 4
HICKORY VALLEY BRANCH
47 7.5 BALD KNOB
T/GREAT FALLS RES 052091
SEC RD BRDG 1 MI ENE OF RIVER HILL
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	09 30		0.340	0.440	0.012	0.005K	0.015
73/05/15	14 00		0.240	0.200	0.019	0.005K	0.010
73/06/07	12 45		0.460	3.300	0.131	0.013	0.025
73/07/07	10 00		0.590	0.160	0.038	0.005K	0.015
73/08/14	15 40		0.010K	0.200	0.008	0.005K	0.020
73/09/19	15 20		0.530	1.000	0.044		
73/10/17	15 25		0.010K	0.300	0.009	0.008	0.025
73/11/16	15 50		0.010K	0.150	0.010	0.025	0.055
73/12/19	15 45		0.630	0.100K	0.005K	0.016	0.020
74/01/22	15 35		0.820	0.100K	0.032	0.028	0.075
74/02/15	15 45		0.780	0.100K	0.015	0.005	0.010
74/02/28	14 20		0.740	0.100	0.030	0.005K	0.020
74/04/12	15 50		0.338	0.200	0.017	0.010	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

471361
35 50 17.0 085 29 24.0 4
CALFKILLER RIVER
47 7.5 BALD KNOB
T/GREAT FALLS RES 052091
SEC RD BRDG 7 MI SE OF GREENWOOD CHURCH
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	09	05	0.530	0.280	0.039	0.013	0.020
73/05/15	14	00	0.550	1.800	0.063	0.017	0.045
73/06/07	12	00	0.460	0.750	0.020	0.016	0.075
73/07/07	09	30	1.000	0.120	0.023	0.015	0.050
73/08/14	15	25	0.012	1.100	0.007	0.014	0.100
73/09/19	15	00	0.670	0.460	0.012	0.058	0.115
73/10/17	15	10	0.260	1.100	0.026	0.068	0.125
73/11/16	15	30	0.399	0.400	0.023	0.062	0.110
73/12/19	15	50	0.710	0.200	0.016	0.032	0.040
74/01/22	15	15	0.560	0.100	0.016	0.016	0.040
74/02/15	15	30	0.580	0.100K	0.015	0.010	0.020
74/02/28	14	00	0.570	0.100K	0.015	0.010	0.030
74/04/12	15	30	0.384	1.400	0.160	0.010	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

APPENDIX E

PARAMETRIC RANKINGS OF LAKES SAMPLED BY NES IN 1974

STATE OF TENNESSEE

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
4701	LAKE BARKLEY	0.128	0.490	473.381	12.723	10.400	0.047
4704	BOONE RESERVOIR	0.052	0.995	442.071	11.415	14.600	0.029
4706	CHEATHAM RESERVOIR	0.142	0.460	473.800	8.160	9.600	0.084
4707	CHEROKEE LAKE	0.051	0.780	448.667	12.162	15.000	0.022
4708	CHICKAMAUGA LAKE	0.031	0.440	463.833	3.111	9.600	0.012
4711	DOUGLAS LAKE	0.026	0.440	442.823	4.553	15.000	0.014
4712	FORT LOUDON RESERVOIR	0.054	0.550	465.571	4.776	12.600	0.025
4713	GREAT FALLS LAKE	0.020	0.405	444.417	3.983	14.800	0.007
4717	NICKAJACK RESERVOIR	0.051	0.495	459.833	2.742	9.700	0.025
4720	OLD HICKORY LAKE	0.058	0.330	469.769	8.931	9.400	0.019
4722	WATTS BAR RESERVOIR	0.032	0.510	462.250	5.550	11.000	0.012
4723	J. PERCY PRIEST RESERVOI	0.056	0.155	430.200	9.993	15.000	0.021
4724	TIM'S FORD RESERVOIR	0.021	0.445	398.167	6.739	14.900	0.009
4725	SOUTH HOLSTON LAKE	0.014	0.570	404.750	7.667	15.000	0.008
4727	REELFOOT LAKE	0.233	0.170	477.917	80.958	13.200	0.059
4728	WOODS RESERVOIR	0.017	0.320	429.083	7.392	15.000	0.005

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500- MEAN SEC	MEAN CHLORA	15- MIN DO	MEDIAN DISS ORTHO P	INDEX NO
4701	LAKE BARKLEY	13 (2)	40 (6)	13 (2)	7 (1)	73 (11)	13 (2)	159
4704	BOONE RESERVOIR	40 (6)	0 (0)	73 (11)	20 (3)	47 (7)	20 (3)	200
4706	CHEATHAM RESERVOIR	7 (1)	47 (7)	7 (1)	40 (6)	90 (13)	0 (0)	191
4707	CHEROKEE LAKE	50 (7)	7 (1)	53 (8)	13 (2)	13 (0)	40 (6)	176
4708	CHICKAMAUGA LAKE	67 (10)	63 (9)	33 (5)	93 (14)	90 (13)	70 (10)	416
4711	DOUGLAS LAKE	73 (11)	63 (9)	67 (10)	80 (12)	13 (0)	60 (9)	356
4712	FORT LOUDON RESERVOIR	33 (5)	20 (3)	27 (4)	73 (11)	60 (9)	27 (4)	240
4713	GREAT FALLS LAKE	87 (13)	73 (11)	60 (9)	87 (13)	40 (6)	93 (14)	440
4717	NICKAJACK RESERVOIR	50 (7)	33 (5)	47 (7)	100 (15)	80 (12)	33 (5)	343
4720	OLD HICKORY LAKE	20 (3)	80 (12)	20 (3)	33 (5)	100 (15)	53 (8)	306
4722	WATTS BAR RESERVOIR	60 (9)	27 (4)	40 (6)	67 (10)	67 (10)	70 (10)	331
4723	J. PERCY PRIEST RESERVOI	27 (4)	100 (15)	80 (12)	27 (4)	13 (0)	47 (7)	294
4724	TIM'S FORD RESERVOIR	80 (12)	53 (8)	100 (15)	60 (9)	33 (5)	80 (12)	406
4725	SOUTH HOLSTON LAKE	100 (15)	13 (2)	93 (14)	47 (7)	13 (0)	87 (13)	353
4727	REELFOOT LAKE	0 (0)	93 (14)	0 (0)	0 (0)	53 (8)	7 (1)	153
4728	WOODS RESERVOIR	93 (14)	87 (13)	87 (13)	53 (8)	13 (0)	100 (15)	433